PACSystems™ RX7i

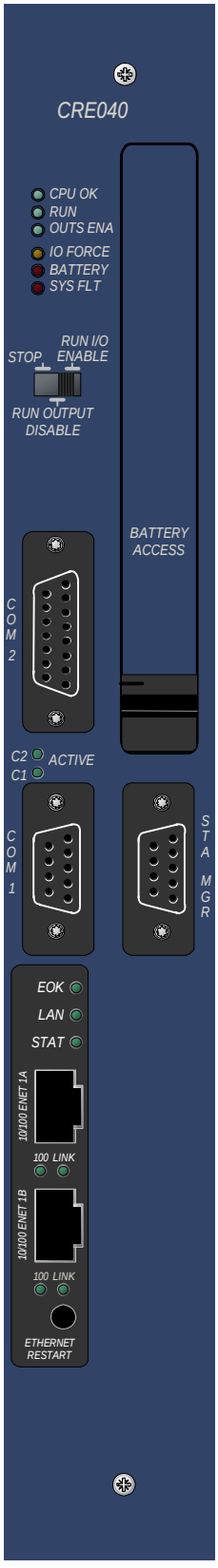
IC698CRE030-BB, IC698CRE040-BB

Redundancy CPUs

GFK-2459B
July 19, 2007

The RX7i CPUs are programmed and configured by the programming software to perform real time control of machines, processes, and material handling systems. The CPU communicates with I/O and smart option modules over a rack-mounted backplane using the VME64 Standard format. It communicates with the programmer and HMI devices via the embedded Ethernet port or serial port.

CRE030: 600MHz Pentium-M microprocessor with 64 MB of user memory and 64 MB of user flash
CRE040: 1800MHz Pentium-M microprocessor with 64 MB of user memory and 64 MB of user flash



Features

- Hot standby (HSB) redundancy. Requires a Redundancy CPU and a Redundancy Memory Xchange module (IC698RMX016) configured as a redundancy link in each unit.
- Contains 64 Mbytes of battery-backed user memory and 64 Mbytes of non-volatile flash memory for user data (program, configuration, register data and symbolic variable storage).
- Access to bulk memory via reference table %W.
- Configurable data and program memory.
- Programming in Ladder Diagram, C, Structured Text and Function Block Diagram.
- Auto-located Symbolic Variables that can use any amount of user memory.
- Support for Series 90-70 discrete and analog I/O, communications, and other modules. For a list of modules supported, refer to the PACSystems RX7i Installation Manual, GFK-2223.
- Supports all non-GE Fanuc VME modules supported by Series 90-70.
- Allows PLC data monitoring over the web. Allows a combined total of up to 16 web server and FTP connections.
- Supports up to 512 program blocks. Maximum size for a block is 128KB.
- Test Edit mode allows you to easily test modifications to a running program.
- Bit-in-word referencing.
- Battery-backed calendar clock.
- CPU and module firmware upgrades through the CPU's RS-232 or RS-485 serial port.
- Three isolated serial ports: an RS-485 serial port, an RS-232 serial port, and an RS-232 Ethernet station manager serial port.
- An embedded Ethernet interface provides:
  - Data exchange using Ethernet Global Data (EGD)
  - TCP/IP communication services using SRTP
  - Support for SRTP Channels, Modbus/TCP Server and Modbus/TCP Client
  - Full PLC programming and configuration services
  - Comprehensive station management and diagnostic tools
  - Two full-duplex 10BaseT/100BaseT/TX (RJ-45 Connector) ports with an internal network switch providing auto-negotiated network speed, duplex mode, and crossover detection.
- User-configurable Redundant IP allows:
  - Configuration of EGD exchanges to be produced from the active and inactive Ethernet interface(s) in an HSB Redundant pair.
  - Within a HSB Redundant CPU, production of EGD exchanges from an Ethernet interface that does not have a Redundant IP address configured.

Specifications

For environmental specifications and compliance to standards (for example, FCC or European Union Directives), refer to Appendix A of the *PACSystems RX7i Installation Manual,* GFK-2223.

Battery: Memory retention		Estimated 30 days using an IC693ACC302 Auxiliary Battery Module at 20ºC. For details on the operation of the Auxiliary Battery Module, refer to the datasheet, GFK-2124. **Note:** The IC698ACC701 RX7i Replacement Battery is ***not compatible*** with the CRE030 or CRE040 CPU modules.
Program storage		Up to 64 Mbytes of battery-backed RAM 64 Mbytes of non-volatile flash user memory
Power requirements:	CRE030	+5 VDC: 3.2 Amps nominal +12 VDC: 0.003 Amps nominal -12 VDC: 0.003 Amps nominal
	CRE040	+5 VDC: 6.8 Amps nominal +12 VDC: 0.003 Amps nominal -12 VDC: 0.003 Amps nominal
Operating temperature:	CRE030	0 to 50°C (32°F to 122°F) 0 to 60°C (32°F to 140°F) with fan tray
	CRE040	0 to 60°C (32°F to 140°F), fan tray required
Boolean execution speed, typical:	CRE030	0.069ms per 1000 Boolean contacts/coils
	CRE040	0.024ms per 1000 Boolean contacts/coils
Time of Day Clock accuracy		Maximum drift of ±2 seconds per day
Elapsed Time Clock (internal timing) accuracy		±0.01% maximum
Embedded communications		RS-232, RS-485, Ethernet interface
Serial Protocols supported		Modbus RTU Slave, SNP, Serial I/O
Ethernet Ports		Embedded auto-sensing 10/100 Mbps half/full duplex Ethernet interface
VME Compatibility		System designed to support the VME64 standard ANSI/VITA 1
Program blocks		Up to 512 program blocks. Maximum size for a block is 128KB.
Memory (For a detailed listing of memory areas, refer to the CPU Reference Manual, GFK-2222.)		*%I and %Q:* 32Kbits for discrete *%AI and %AQ:* configurable up to 32Kwords *%W:* configurable up to the maximum available user RAM Managed memory (*Symbolic and I/O variables combined):* configurable up to 10 Mbytes
Ethernet Interface Specifications		
Web-based data monitoring		Up to 16 web server and FTP connections (combined)
Ethernet data rate		10Mb/sec and 100Mb/sec
Physical interface		10BaseT RJ45
WinLoader support		Yes
Number of EGD configuration-based pages		255
Time synchronization		SNTP
Selective consumption of EGD		Yes
Load EGD configuration from PLC to programmer		Yes
Remote Station Manager over UDP		Yes
Local Station Manager (RS-232)		Dedicated RS-232 port
Configurable Advanced User Parameters		Yes

Release History

Catalog Number	*Date*	*CPU Firmware Version*	*Ethernet Firmware Version*
IC698CRE040-BB	Jul. 2007	CPU: 4.02	Ethernet: 4.00
IC698CRE040-AB	Dec. 2006	CPU: 4.02	Ethernet: 4.00
IC698CRE040-AA (initial release)	Oct. 2006	CPU: 4.01	Ethernet: 4.00

IC698CRE030-BB	Jul. 2007	CPU: 4.02	Ethernet: 4.00
IC698CRE030-AB	Dec. 2006	CPU: 4.02	Ethernet: 4.00
IC698CRE030-AA (initial release)	Oct. 2006	CPU: 4.01	Ethernet: 4.00

Updates

If your system exhibits the symptoms described in “CPU Problems Resolved by this Hardware Revision of Product (-Bx)” on page 5, please contact GE Fanuc Technical Support.

CPU Functional Compatibility

Subject	*Description*
Extended operation with dissimilar CPU models is not allowed	During normal operation, the primary and secondary units in an HSB redundancy system must have the same CPU model type. Extended operation with dissimilar CPU types is ***not allowed.*** The primary and secondary units with dissimilar CPU model types can be synchronized for a limited time, for the purpose of system upgrade only. Fail wait times for the higher performance CPU in a dissimilar redundant pair may need to be increased to allow synchronization. Either model can be in the primary or secondary unit.
Programmer version requirements	Proficy™ Machine Edition Logic Developer PLC 5.5 Service Pack 2 or later must be used for Release 4.00 new features.
C Toolkit compatibility	The C Toolkit Release 3.50 Build 34A1 is required for new features in PACSystems Release 3.80. (Use of symbolic variables in C Blocks). The C Toolkit for PACSystems is distributed with Machine Edition Logic Developer PLC 4.0 or greater. Toolkit build 21A2 or later is required for use with the RX7i. Toolkit build 47A1 or later is required for use with the Release 2.00 new features. Please note: The Series 90-70 Toolkit (IC641SWP709/719) is not compatible with PACSystems RX7i.
Battery pack compatibility	The Auxiliary Battery Module (IC693ACC302A) must be used with the PACSystems RX7i CRE030/CRE040 CPU for memory retention. The RX7i three-cell lithium battery pack (IC698ACC701) cannot be used with the CRE030 and CRE040 CPUs.
Series 90-70 Expansion Rack compatibility	The PACSystems RX7i supports Series 90-70 expansion racks.
Series 90-70 Main Rack compatibility	Series 90-70 Main Racks cannot be used in a PACSystems RX7i system. PACSystems RX7i CPUs and the RX7i Ethernet Module do not operate in any Series 90-70 rack.
Series 90-70 Module compatibility	For a list of modules supported by the RX7i CPUs, refer to the *PACSystems RX7i Installation Manual,* GFK-2223.

Subject	Description
Insulating strips for high voltage modules	An insulator strip is required on a high voltage module that is installed to the immediate right of a module with a metal faceplate. Insulating strips should be installed on the following modules that have versions earlier than: IC697MDL240**D** IC697MDL640**E** IC697MDL241**D** IC697MDL340**G** IC697MDL250**G** IC697MDL341**E** IC697MDL251**E** IC697MDL350**F** **Note:** Current versions of these modules are shipped with the insulators installed. The strip is visible on the back of the printed wiring assembly. The RX7i rack is shipped with an Insulator Kit that includes enough parts to update three Series 90-70 I/O modules, a BEM713 (Bus Transmitter) module, and a BEM731 (Genius Bus Controller) module.

Ethernet Functional Compatibility

Subject	Description
SRTP and EGD performance differs from Series 90-70	SRTP and EGD performance in the RX7i differs slightly from the Series 90-70. Each RX7i Ethernet Interface supports a greater number of SRTP connections and EGD exchanges. Please also note that the RX7i currently has several SRTP and EGD operational restrictions when compared to the Series 90-70. When migrating Series 90-70 Ethernet applications to the RX7i, please carefully read the "Ethernet Operational Notes" section on page 11.
Series 90-70 LAN Interface Modules (IC697CMM741 and IC697CMM742) not supported by RX7i	Please note that the Series 90-70 LAN Interface Modules (IC697CMM741 and IC697CMM742) are not supported by the RX7i and should not be placed in an RX7i rack. The RX7i CPU contains an embedded Ethernet Interface. If additional Ethernet Interfaces are required, the RX7i Ethernet Module (IC698ETM001) should be used.
Programmer version requirements	Proficy Machine Edition Logic Developer PLC 5.0 Service Pack 3 or later must be used to program the PLC CPU for Modbus/TCP operation.
CIMPLICITY® Plant Edition version requirements	CIMPLICITY Plant Edition 6.1 Service Pack 1a with Update 040204_s90tcp_6101 or Service Pack 2 or later must be used for Ethernet communications with PACSystems.

Important Product Information for this Release

CPU Problems Resolved by this Hardware Revision of Product (-Bx)

100W Power Supply now powers up correctly.

Infrequently when using a 100W power supply during initial power up or power cycling with version -Ax of these CPUs, the power supply's Output OK LED remains unlighted. This issue has been resolved in the –Bx hardware version. The 300W and 350W power supplies are unaffected by this issue.

CPU Problems Resolved in Firmware Release 4.02

Subject	*Description*
POSCON, NEGCON, POSCOIL, and NEGCOIL now operate correctly.	In firmware release 4.01, when the POSCON, NEGCON, POSCOIL, and NEGCOIL instructions are in the first rung of an LD block, they can pass power flow when they should not. This issue has been corrected in release 4.02

CPU Restrictions and Open Issues

Subject	*Description*
Battery Installation	When installing a new battery, when there currently is no battery installed, the battery must be installed while the CPU has power. Failing to follow this procedure could result in the CPU not powering up. If a battery is installed while power is off (and there was no battery previously installed), and the CPU fails to power up, simply remove the battery, power cycle the CPU and then install the battery.
Ethernet Disconnect During Word for Word Change	If the Ethernet connection is broken during a word–for-word change, the programmer may not allow a subsequent word-for-word change after reconnecting due to the fact that it thinks another programmer is currently attached. If this occurs, you should go offline and then back online again.
Non-GE Fanuc VME Modules Operating as VME Masters	Non-GE Fanuc VME modules operating as VME bus masters have not been tested with the RX7i. Users interested in integrating this type of functionality should contact technical support.
Store of Hardware Configuration with Multiple GBCs	Storing a hardware configuration containing two or more GBCs twice may cause one GBC to fail configuration. Clearing the hardware configuration between stores will prevent this fault from being generated.
Simultaneous Clears, Loads and Stores Not Supported	Currently, the RX7i does not support multiple programmers changing CPU contents at the same time. The programming software may generate an error during the operation.

Subject	Description
Fault Reporting With Analog Expanders	For fault reporting when an analog expander is used in a Series 90-70 Expansion Rack, a special case exists when the ALG230 base module is in slot 2 and an expander module is present in slot 9. In this case, if any expander module loses communication with the base module, then the fault reports for all 16 channels for that expander display the slot number as 0. The circuit number will be a value from 9 to 120, as shown in the following table. The I/O reference address for each channel is displayed as blank. SLOT EXPANDER CIRCUIT NUMBERS 3 1 9-24 4 2 25-40 5 3 41-56 6 4 57-72 7 5 73-88 8 6 89-104 9 7 105-120 For fault reporting when an analog expander is used in a PACSystems RX7i rack, a special case exists when the base is in slot 4 and an expander is present in slot 11. In this case, the slot number for a faulty expander is always displayed as slot 2, and the circuit number will display according to the slot used for the expander, as shown in the following table. The I/O reference address for each channel is displayed as blank. SLOT CIRCUIT NUMBERS 6 25-40 7 41-56 8 57-72 9 73-88 11 105-120
Power Cycle During Write to Flash	If the CPU is power cycled during the process of writing to flash, and is configured to power up from flash, a fault will be generated on power up.
Hardware Configuration Not Equal After Changing Target Name	If the user stores a hardware configuration to flash which indicates that “Logic/Config Power up Source” is set to “Always Flash” or “Conditional Flash” and then subsequently changes the name of the target in the programming software, the hardware configuration will go Not Equal and will not Verify as equal.
PLC and IO Fault Tables May Need to be Cleared Twice to Clear Faulted State	Both PLC and IO fault tables need to be cleared to take the CPU out of Stop/Fault mode. If one of the tables contains a recurring fault, the order in which the tables are cleared may be significant. If the CPU is still in Stop/Fault mode after both tables are cleared, try clearing the fault tables again.
VME Modules Using Program Type AM Codes	When Block Transfers are enabled with a VME memory region that uses one of the program type AM Codes, the Rx7i CPU sometimes generates block transfer (BLT & MBLT) cycles to access the associated VME memory. Therefore, if you have a VME memory region configured to use one of the program type AM Codes (AM Codes 3Ah, 3Eh, 0Ah, or 0Eh), be sure to follow at least one of these two rules: a) The memory region's Interface Type parameter must <u>not</u> be set to "Qword Access (64-bit)", and the VME Block Transfer parameter must be set to "Disabled". -OR- b) The system may not contain any "program" and "data" VME memory regions with overlapping VME addresses. (If more than one VME module were to respond to a BLT or MBLT cycle, a system error could result.)
Setting Force On/Off by Storing Initial Value	Once a force on or force off has been stored to the PLC, the user cannot switch from force on to force off or vice-versa directly by downloading initial values. The user can turn off the force by doing a download, and then change the force on or off by another download.

Subject	*Description*
CMM COMMREQ Restriction	Due to an issue in the CMM firmware, the SNP COMM_REQ Read System Memory (7202) executed on a CMM module does not execute correctly for lengths greater than 760 words. Incorrect data is written to the SNP Master. Users should not use lengths greater than 760 words.
Number of Active Programs Returned as Zero	The SNP request Return Controller Type and ID currently returns the number of active programs as zero.
Serial I/O Failure at 115K During Heavy Interrupt Load	Rare data corruption errors have been seen on serial communications when running at 115K under heavy interrupt load on the PLC. Under heavy load applications, users should restrict serial communications to 57K or lower.
Synchronized Backup Unit May Log Over Sweep Faults In Constant Sweep Mode	A synchronized backup unit may report over sweep faults in constant sweep mode regardless of the amount of time spent servicing IO, logic, and communications in the sweep.
Bus Read or Write May Return Status of 5 Instead of 4	In some cases, the Bus Read/Write Status Word returned may be 4 instead of 5 when the ending address is out of range.
Hardware Configuration and Initial Values May Not Load From Flash	The CPU may not load hardware configuration and/or initial values from flash when the configuration indicates to load from flash when the hardware configuration and/or initial values are stored to RAM without storing logic and then written to flash.
CPU Sweep Time Increases During Overtemp Operation	When the operating temperature of the CPU exceeds the normal operating temperature, system variable #OVR_TMP (%SA8) turns ON (Fault group 24, error code 0x0001). When this occurs the sweep time periodically increases because the CPU executes a new task to read the actual temperature reported by a temperature sensor. This increase can be as much as 2 ms.
GBC in Expansion Rack May Fail to Power Up	Occasionally, a EM731 module located in an expansion rack may fail to power up when power to that rack is cycled off/on. The module's OK light will flash and then all module lights will go off. Power cycle the rack again to recover.
Possible ME inability to connect	Infrequently, an attempt to connect a programmer to a PLC via Ethernet will be unsuccessful. The normal connection retry dialog will not be displayed. Rebooting the computer that is running the programmer will resolve the behavior.
Don't use multiple targets	In a system in which the hardware configuration is stored from one target and logic is stored from a different target, powering-up from flash will not work. The observed behavior is that, following a power up from flash, ME reports hardware configuration and logic "not equal".
Sequence Store Failure	In systems with very large hardware configuration, it is possible to encounter a "PLC Sequence Store Failure" error when writing the configuration to flash. To workaround this error, either: Perform an explicit clear of flash prior to performing the write. Increase the operation timeout used by ME prior to performing the write.
Thermocouple Module Fails to Power Up Correctly	After some power loss events, the Horner Thermocouple module (HE697THM160) may fail to power up successfully. After failure, the AI data will not be updated correctly and will continue to return zero values. There are no module fault indicators for this event. The user should power cycle again to restore normal function.
C Toolkit PlcMemCopy Documentation Incorrect	This routine does allow the destination and source pointers to be outside of reference memory. If the destination points to discrete reference memory, overrides and transitions will be honored. Note that the header for PlcMemCopy has been updated in Release 3.50of the C toolkit.
Fault Contacts on Modules in Expansion Rack	When an expansion rack powers up, the slot fault contacts will prematurely indicate that the modules in the expansion rack are not faulted *before* they complete their power up. Use I/O point fault contacts to verify validity of the I/O.
Fault Contacts on Remote I/O Station	If multiple faults exist in a Series 90-70 Remote I/O Station and one of them is corrected, a FAULT contact that uses the Remote I/O Station's module reference will incorrectly indicate that no faults exist at the Remote I/O Station.

Subject	Description
BIT_SEQ Function Block DIR Parameter	The BIT_SEQ Function Block should require the user to flow BOOLEAN logic into the DIR parameter, but currently does not. If no DIR parameter is present, the BIT_SEQ will increment by default.
Improper use of BIT_SEQ could result in CPU going to Stop-Halt	Before using the BIT_SEQ function block, the current step number (in the control block) must be set to a valid value between 1 and the length (in the control block). Failure to properly initialize the count step number in the BIT SEQUENCER function block may result with the CPU going to STOP-HALT mode

Ethernet Restrictions and Open Issues

Subject	Description
Number of SRTP Requests Tallied May Vary	When running multiple SRTP client channels, the number of requests, as reported by the client and the server, may differ between the connections.
Reporting of Duplicate IP Address	The RX7i does not log an exception or a fault in the PLC Fault Table when it detects a duplicate IP address on the network.
REPP Does Not Save Results of Aborted PING	The station manager REPP command does not retain the results of a PING that is aborted due to error. The PING results are reported when the PING is aborted, but subsequent REPP commands give the results of the last successfully terminated PING.
Multiple Log Events	The Ethernet Interface sometimes generates multiple exception log events and PLC Fault Table entries when a single error condition occurs. Under repetitive error conditions, the exception log and/or PLC Fault Table can be completely filled with repetitive error messages.
Intermittent SNTP Loss of Synchronization	Under moderately heavy EGD traffic load, the Ethernet Interface may occasionally lose synchronization with its SNTP time server and generate exception log event 29, entry 2=bH.
Reduced EGD Consumption with Large Numbers of Produced Exchanges	When large numbers of EGD exchanges are produced at a rapid rate, some consumed EGD exchanges may exhibit lower rates of consumption than expected. To better balance produced and consumed EGD exchange performance, reduce the number or frequency of the produced exchanges configured at this Ethernet Interface.
SRTP Communication Delays	Average latency of communications on SRTP channels may vary considerably due to TCP retransmissions. SRTP client applications should be designed to take this variance into account. In particular, SRTP client applications migrating from Series 90-70 SRTP Servers to RX7i may need to lengthen SRTP timeout parameters.
PLC Fault Table Last Update Date and Time	The PLC Fault Table web page does not display the correct data for the PLC date and time field. The date and time displayed are the PCs local date and time, not the PLCs date and time.
Spurious 'Ethernet Failure' Error	On rare occasions, the error "Module hardware fault" may be reported on the Ethernet daughterboard. The corresponding fault in the exception log is Event = 1, followed by text "Ethernet failure". This fault is a nuisance fault and may be ignored. 0.1 Module hardware fault 01-01-2000 00:00:00 Error Code Group Action Task Num 468 14 2:Diagnostic n/a Fault Extra Data: 00 45 74 68 65 72 6e 65 74 20 46 61 69 6c 20 20 38 30 30 31 30 36 31 46
Web Server Failure Under Heavy Load	After several hours of heavy load on the web server, the web server may fail to return pages and may cause a LAN system-software fault to be logged. The web server will resume serving pages when the load is reduced.

Subject	*Description*
Reference Table Web Page Restriction	After the user selects a user defined table, if the user then tries to go back to the pre-defined table of %R1-%R60, an error message may be displayed stating “An error was detected when trying to retrieve setting from PC cookie”.
Fault Table Web Page Restriction	On both the I/O and PLC Fault Table web pages, the PLC program name is not currently displayed in the area provided.
Cannot Set FTP Password	The CHPARM TPASSWORD Station Manager command fails. Processing an AUP File containing parameter “tpassword” generates an error.
Reference Table Web Page Format	When using Netscape 4.7 to view the reference table web page, the size of the columns is incorrect. The first column is much wider than the others.
Spurious Ethernet Fault	In rare instances, after power cycle, the Ethernet Interface may log the following fault, Event = 28H, Entry 2 = 000eH. This fault can be safely ignored.
Release 2.00 PLC Faults Are Not Identified on Web Page	When any PLC Fault Table entries defined for Release 2.00 or later are displayed using the Ethernet interface web server, the PLC Fault description contains only a generic message instead of the proper fault text.
Unexpected EGD COMMREQ Status	EGD Commands may return COMMREQ Status 9590H (= internal error) instead of the expected B190H (= Can’t locate remote node) when unable to locate a remote device on the network.
Too many EGD Commands Reported as Internal Error	The Ethernet Interface supports 10 simultaneous EGD commands. When an 11th EGD Command COMMREQ is issued, the CSW value 9590H (= internal error) is returned.
EGD Command Passwords Are Not Supported.	Optional passwords are not allowed within EGD Command COMMREQs.
Very Heavy EGD Production/Consumption at Server May Cause EGD Command Timeouts	Very heavy EGD production and/or consumption at a server device may cause EGD command timeout errors when another device attempts to send EGD commands to that server. If EGD commands must preempt normal production, you may set the “gcmd_pri” Advanced User Parameter to 2 (see GFK-2224, Appendix A). Note that by doing so, EGD exchange production may be delayed.
SRTP Server Errors Can Cause Timeouts at Channels Client	The SRTP Server in the PACSystems Ethernet Interface can encounter various errors when the remote Series 90 PLC client takes down an SRTP connection and then establishes a new connection. This can cause unexpected channel timeout errors 0190H or 0290H at the client. The SRTP server errors in the Ethernet exception log are identified as Event = 2; Entry 2 may be 001cH, or 0021H.

Subject	Description
EGD Command Range Failure Can Write Partial To PLC Bit Memory	When an EGD Command attempts a write operation to a bit-mode PLC reference memory range (%I, %Q; %T, %M, %SA, %SB, %SC) where the amount of data be written exceeds the configured size of that reference memory, the command will return failure status but partial data may be written into the reference memory. The amount of partial data written depends upon the starting bit memory location and the data length as follows: - If data starts on a byte boundary (location = (8*n) + 1), no partial data is written. - If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by 8 or more bits, partial data is written from the starting location to the next byte boundary after the starting location. - If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by less than 8 bits, partial data is written from the stating location to the end of configured reference memory. - For a Write PLC Memory command, this can occur when writing data into the target PLC. For Read PLC Memory or Read Exchange commands, this can occur when writing data received from the target PLC into the local PLC memory. The logic application must not use any data returned to the local PLC if the EGD command status indicates failure. - To avoid writing partial data to the local or remote PLC, be sure that bit memory data transfers do not exceed the configured reference memory sizes at the appropriate PLC.
Usage of New IP/Subnet Mask Configuration	Because the Ethernet interface operates using a retained set of IP address + subnet mask information, a change to these values does not take effect until a restart of the module or power cycle of the rack containing the module. The user should be aware when altering these configuration values that their effect is not immediate.
Cannot Change EGD Class 2 UDP Port Number	Processing an Advanced User Parameter File containing parameter “gctl_port” does not actually change the value.
COMMREQ Length Error	The COMMREQ Status Word value 8190H (="COMMREQ is too short") may also be reported for EGD Command COMMREQs that are too long (contain more words than expected).
No CPU fault logged when Ethernet Interface in fatal blink code	The CPU does not log any PLC or I/O Faults when the Ethernet Interface has a fatal blink code. The user’s application should monitor the LAN interface OK status bit to detect loss of module.
EGD I/O has unexpected variability under heavy load	EGD I/O has intermittent unexpected variability under heavy load. For a Produced Exchange, EGD samples may occasionally be delayed by as much as a production period.
Clear of large hardware configurations may cause log event 08/20	A Log event 08/20 may occur when very large hardware configurations are cleared and transfers are active on other Server connections. This log event can be safely ignored.
CRSW of 0x54A0 occasionally returned for EGD commands	Occasional COMMREQ Status Word values of 0x54A0 are returned to COMMREQs for EGD commands when the previously transferred command has experienced retries in the network. Executing the COMMREQ again results in successful transfer of the command.
Modbus/TCP channel aborted during power-cycle	After powering up a PLC running Modbus/TCP client channels, the establish connection occasionally fails because the server occasionally rejects the "open" from the client. The connection will then succeed if the application retries the open when it sees a 0x9690 or 0xAA90 response to an open request or to the first write request.
EX8 stops producing EGD	When the PLC transitions from Stop to Run mode, the Ethernet module may not begin producing EGD. To recover the PLC must be put back into stop mode and then transitioned to Run mode.

Subject	*Description*
Abrupt Termination of SRTP Connections Causes Nuisance Faults in Fault Log	In conditions where SRTP connections are terminated abruptly (as by a TCP reset, or Redundant IP connection termination), several nuisance faults may be generated in the Ethernet exception log and PLC Fault Table. These Ethernet log events can be ignored. These Ethernet log events include: Event 8, Entry 2 = 6 "Backplane communications with PLC Fault; lost request." A mailbox message (other than COMMREQ) was received from the PLC CPU for an unknown or unregistered BPD User task. Event 8, Entry 2 = 4 "Backplane communications with PLC Fault; lost request" Mailbox packets were received from the PLC CPU in wrong order. Event 8, Entry 2 = 17 "LAN system-software fault; resuming" Error sending a mailbox transfer to a BPD User task. Event 8, Entry 2 = 16 "LAN system-software fault; resuming" Error receiving a mailbox transfer from the PLC CPU.

CPU Operational Notes

Subject	*Description*
Transfer List Validation not compatible with Release 2.0x CRE020	Redundant transfer lists generated using CPU Firmware release 2.0x or earlier are not compatible with the release 3.80 and later transfer lists. Redundant controllers that are running release 2.0x will not be able to synchronize with controllers that are running release 3.80 or later firmware.
Only one BTM allowed in main rack	Only one BTM is allowed in the main rack. Multiple BTMs in the main rack will result in undefined operation.
Logic executed in row major instead of column major	Logic execution in PACSystems RX7i is performed in row major order (similar to the Series 90-30) instead of column major (similar to the Series 90-70). This means that some complicated rungs may execute slightly differently on PACSystems RX7i and Series 90-70. For specific examples, see the programming software on-line help.
Upgrading firmware with modules in rack	The process of upgrading the CPU firmware with the WinLoader utility may fail when multiple IO modules are in the main, remote or expansion racks, due to the time it takes to power cycle the rack system. If the upgrade process fails, move the CPU to a rack without IO modules and restart the upgrade process.
NaN handled differently than in 90-70	The PACSystems RX7i CPU may return slightly different values for Not A Number as compared to Series 90-70 CPUs. In these exception cases (e.g., 0.0/0.0), power flow out of the function block is identical to Series 90-70 operation and the computed value is still Not A Number.
PID algorithm improved	The PID algorithm used in PACSystems RX7i has been improved and therefore PID will function slightly differently on PACSystems RX7i than on the Series 90-70. The differences are: 1. The elapsed time is computed in 100 µS instead of 10 mS units. This smoothes the output characteristic, eliminating periodic adjustments that occurred when the remainder accumulated to 10mS. 2. Also, previous non-linear behavior when the integral gain is changed from some value to 1 repeat/second was eliminated.
Service Request 13 command block must contain zero	When the Service Request function block is used to invoke Service Request #13, the first word of the command block sets the number of last scans to be executed. If the value of that word is -1 (or 0xFFFF), then the number of last scans is set to the value in the configuration.
Changing IP address of Ethernet interface while connected	Storing a hardware configuration with a new IP address to the RX7i while connected via Ethernet will succeed, then immediately disconnect because the RX7i is now using a different IP address than the Programmer. You must enter a new IP address in the Target Properties in the CME Inspector window before reconnecting.

Subject	Description
Stack allocation for folders converted from Series 90-70 must be increased	Series 90-70 folders are converted to PACSystems RX7i with the same stack allocation. PACSystems RX7i uses more stack space than the Series 90-70, so some folders may not run after conversion. To increase the stack space, right click the _MAIN block and select Properties. Stack Size is listed at the bottom of the Properties page. The default stack size in new PACSystems RX7i folders is 64KB. Folders with a large number of nested calls may need more stack space. As a general rule, the stack for the converted PACSystems RX7i folder should be set to approximately three times the stack size of the Series 90-70 version of the folder. A diagnostic fault will be displayed if the folder runs out of stack space.
Duplicate station address for Modbus will conflict with other nodes	The default serial protocol for the RX7i is Modbus RTU. The default Station Address is 1. If the PLC is added to a multi-drop network, care must be taken that the PLC is configured with a unique Station Address. Nodes with duplicate Station Addresses on the same network will not work correctly.
#FST_EXE no longer represented by %S121	The PACSystems RX7i implementation of #FST_EXE is different from the Series 90-70 implementation. #FST_EXE is no longer stored in %S (%S121) memory. Instead, it is stored in a local memory that is not accessible to the user. You can reference #FST_EXE only by using its name (similar to referencing a symbolic variable). The #FST_EXE system variable can be accessed (read) in the logic of any block. Just as in the Series 90-70, PSB blocks and C blocks inherit the #FST_EXE value of their calling block. Again, as in the Series 90-70, #FST_EXE cannot be written.
Format for fault locating references changed	Compared to the Series 90-70 CPU, syntax for the fault locating references has changed as follows: #RACK_00r is now #RACK_000r. #SLOT_rss is now #SLOT_0rss. #BUS_rssb is now #BUS_0rssb. #M_rssbmm is now #M_rssbmmm (adds support for 256 modules). Existence of old style (Series 90-70) fault locating references will cause errors to be generated during logic validation. The error will have the following format: “Error 9618: Invalid reference type for operand [LD Block,’_MAIN’: Rung 7]”
Slot restrictions for analog expander module in RX7i rack	The following restrictions apply to Analog Expansion Modules in a PACSystems RX7i rack: ■ The base module must be in a slot no lower than Slot 4. ■ The expander module must be in a slot no higher than Slot 11. ■ No expander module may be in a slot lower than the base module. Because of these restrictions, and because the 90-70 modules occupy two slots in the PACSystems RX7i rack, a maximum of three expanders are possible. (Base in Slot 4, Expanders in Slots 6, 8, and 10 or Base in Slot 5, Expanders in Slots 7, 9, and 11.) Please note that these restrictions do not apply to Analog Expansion Modules in Series 90-70 expansion racks.
Genius Bus Controller restrictions	The following restrictions apply to GBCs in PACSystems RX7i: ■ The minimum CPU sweep time will be gated by the time it takes the GBC to refresh its outputs and collect its inputs + 500 microseconds. To obtain a smaller sweep time, use the SUSIO function block or place the GBCs in a scan set that has non-default characteristics. ■ If a %W reference address is used for COMMREQ status or return data, it must be in the range %W00001 - %W65536. ■ Storing or clearing a hardware configuration containing two GBCs attached to the same Genius network may cause a Loss of Device fault for one of the GBCs. This is caused by the GBCs clearing their SBAs asynchronously. The user can safely ignore the Loss of Device fault.

Subject	*Description*
Communication Coprocessor Module restrictions	PACSystems RX7i CPUs with firmware versions 1.50 or later support IC697CMM711 modules with firmware versions 4.20 or later. You must ensure that you are using the correct firmware version of the CMM because the CPU cannot check the CMM's firmware version. (The module's firmware version can be found on a label attached to the module's EEPROM.) PACSystems does not support the following for an IC697CMM711: ■ Connecting to Machine Edition to the CPU through the CMM's serial ports. ■ Access to Symbolic variables memory. ■ WAIT mode COMMREQs. ■ Permanent datagrams. The following restrictions apply when using the IC697CMM711 with PACSystems: ■ Access to %W memory references is partially supported. Only offsets 0—-65535 of %W can be accessed via the CMM. ■ The Program Name is currently always LDPROG1 for PACSystems. ■ Reads and writes beyond currently configured reference table limits will report a minor code error of 90 (REF_OUT_OF_RANGE) instead of F4 (INVALID_PARAMETER) as reported on the Series 90-70. ■ In case of ERROR NACK, the Control Program number, privilege level and other piggyback status data will be set to 0. ■ PACSystems CPUs return the major/minor type of the 90-70 CPX935 (major type 12, minor type 35) to the CMM scratch pad memory when communicating with a CMM. ■ Control Program Number will be returned as 01 in PACSystems instead of FF as reported on the Series 90-70. ■ If your RX7i application program needs to access the dual port memory of a CMM, use the BUS READ and WRITE functions. When accessing the CMM, set the Region parameter on the function block to 1. (For the CMM, region 1 is predefined to be the module's entire dual port memory.) **Note:** For details on operation of the IC697CMM711, refer to the *Serial Communications User's Manual,* GFK-0582.

Subject	Description
Programmable Coprocessor Module restrictions	PACSystems RX7i CPUs with firmware versions 1.50 or later support IC697PCM711 modules with firmware versions 4.05 or later. You must ensure that you are using the correct firmware version of the PCM because the CPU cannot check the PCM's firmware version. (The module's firmware version can be found on a label attached to the EEPROM.) PACSystems does not support the following for IC697PCM711: ■ Connecting Machine Edition to the CPU through the IC697PCM711 module's serial ports. ■ Access to Symbolic variables. ■ WAIT mode COMMREQs. ■ The following C functions are not supported: chk_genius_bus chk_genius_device get_cpu_type_rev get_memtype_sizes get_one_rackfault get_rack_slot_faults ■ The C function write_dev will not write to read only reference tables (%S references, transition bits, and override bits). If this is attempted, the call will fail at run time and return an error code. The following restrictions apply when using the IC697PCM711 with PACSystems: ■ %W memory partially supported. Only offsets 0-65535 of %W can be accessed via the PCM. ■ The Program Name is currently always LDPROG1 for PACSystems. ■ In case of ERROR NACK, the Control Program number, privilege level and other piggyback status data will be set to 0. ■ If an application program running on the PCM accesses the VME bus, the VME addresses being used by that program must be updated to agree with the PACSystems RX7i VME addressing assignments. PACSystems RX7i VME address assignments are described in the *PACSystems RX7i User's Guide to Integration of VME Modules,* GFK-2235. ■ PACSystems CPUs return the major/minor type of the Series 90-70 CPX935 (major type 12, minor type 35) to the PCM scratch pad memory when communicating with a PCM. ■ If your RX7i application program needs to access the PCM's dual port memory, use the BUS READ and WRITE functions. When accessing the PCM, set the Region parameter on the function block to 1. (For the PCM, region 1 is predefined to be the module's entire dual port memory.) **Note:** For details on operation of the IC697PCM711, refer to the *Programmable Coprocessor Module and Support Software User's Manual,* GFK-0255.

Subject	*Description*
PCM (to CPU) communications timeout	The PCM has a default backplane communications timeout value of 5 seconds. After the PCM has sent a request to the CPU, the PCM applies this timeout while waiting on a response back from the CPU. In most cases, the CPU will respond well within the 5–second timeout; however, in certain instances the CPU can take longer than 5 seconds to respond. *These cases are limited to LOADs or STOREs of program and/or configuration -especially if blocks in the program are larger than 8 KBytes. Folders containing EXE blocks (again with *.EXE files >8 KBytes) are most likely to cause problems.* To ensure that the PCMs do not observe backplane timeouts, a file must be loaded (using *term*f) to the PCM. The file must be a binary file named *CPU.EN*V. The contents of this file are as below (all values are specified in hexadecimal): Once the binary file CPU.ENV (below) is created, use *termf* to load CPU.ENV to the PCM. Then execute a soft reset of the PCM. After executing the soft reset, the PCM's backplane communications timeout should be 10 seconds. **Note:** A copy of the above CPU.ENV file can be obtained from http://www.geindustrial.com/cwc/gefanuc/support/ControllersIO/s9070-d.htm. **CAUTION** **The CPU.ENV file *will not* be used when a hard reset is performed on the PCM. With the CPU.ENV file resident in the PCM, a soft reset must be performed after every hard reset of the PCM. Be aware that it is possible to issue a *soft reset* COMMREQ from the Ladder Diagram application; therefore, the application can be modified to handle the required reset of PCMs after a power cycle of the PLC system.**

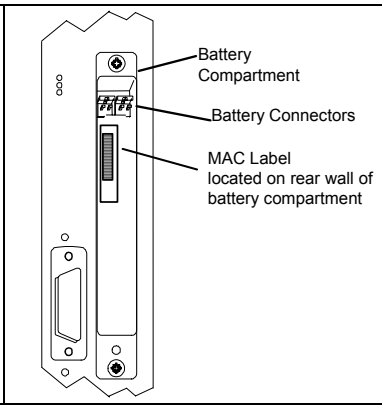
File Offset	Data															
0000	4C	5A	01	01	00	00	00	00-00	00	00	00	01	00	00	00	LZ. . . . .
0010	00	00	00	00	00	00	00	00-00	00	43	50	55	4C	49	4E	. . . . . C P U L I N
0020	4B	2E	43	4F	44	00	2D	62-00	36	34	00	2D	74	00	32	K . C O D . –b . 6 4 .–t . 2
0030	30	30	00	00	43	50	55	4C-49	4E	4B	2E	44	43	42	00	00 . .C P U L I NK . D C B .
0040	00	4E	55	4C	4C	3A	00	4E-55	4C	4C	3A	00	4E	55	4C	. N U L L: . N U L L : . N U L
0050	4C	3A	00	00	00	00	00	00-00	00	00	00	00	00	00	00	L : . . . . .
0060	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	. . . . .
0070	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	. . . . .

DLAN/DLAN+ (Drives Local Area Network) interface restrictions	PACSystems RX7i CPUs with firmware versions 1.50 or later support DLAN Interface, IC697BEM763 modules with firmware versions 3.00 or later. You must ensure that you are using a valid version of the DLAN firmware because the CPU cannot check the DLAN's firmware version. (The module's firmware version can be found on a label attached to the EEPROM.) If your RX7i application program needs to access the DLAN's dual port memory, use the BUS READ and WRITE functions. When accessing a DLAN module, set the Region parameter on the function block to 1. (For the DLAN module, region 1 is predefined to be the module's entire dual port memory.) The DLAN is only supported in the main RX7i rack. It is not supported in expansion racks. **Note:** The DLAN Interface module is a specialty module with limited availability. If you have a DLAN system, refer to the DLAN/DLAN+ Interface Module User's Manual, GFK-0729 for details.

Subject	Description
Backplane Comm window setting and Genius redundancy	When using Genius Redundancy, do not set the backplane communications window timer to 0. Also be sure to allow enough time for the backplane communications window to run when using Constant Sweep mode. Ample backplane communications window time must be available for the GBCs to exchange information about Genius devices that are lost and added.
Expansion rack ID	Series 90-70 expansion racks are shipped with the rack ID strapped for rack 0 (the main rack). If the rack jumper is not changed the PLC CPU will not recognize the rack at all and may not properly identify the error.
Expansion rack cable	Connection and disconnection of an expansion rack cable while the CPU is running should not be attempted. This will cause the PLC to go to the STOP/HALT state.
Expansion rack power	Expansion racks should be powered up at the same time the main rack is powered up or they should be powered up after the main rack has completed its power up initialization. Do not power up an expansion rack while the PLC CPU is running power-up diagnostics.
Timer operation	Care should be taken when timers (ONDTR, TMR, and OFDTR) are used in program blocks that are NOT called every sweep. The timers accumulate time across calls to the sub-block unless they are reset. This means that they function like timers operating in a program with a much slower sweep than the timers in the main program block. For program blocks that are inactive for large periods of time, the timers should be programmed in such a manner as to account for this catch up feature. Related to this are timers that are skipped because of the use of the JUMP instruction. Timers that are skipped will NOT catch up and will therefore not accumulate time in the same manner as if they were executed every sweep.
Constant sweep	Constant Sweep time, when used, should be set at least 10 milliseconds greater than the normal sweep time to avoid any over-sweep conditions when monitoring or performing on-line changes with the programmer. Window completion faults will occur if the constant sweep setting is not high enough. A consistent over sweep condition can cause the programmer to lose communications with the PLC.
Large number of COMMREQs sent to module in one sweep causes faults	A large number of COMMREQs (typically greater than eight) sent to a given board in the same sweep may cause Module Software faults to be logged in the PLC fault table. The fault group is MOD_OTHR_SOFTWR (16t, 10h) and the error code is COMMREQ_MB_FULL_START (2). When this occurs, the “FT” output of the function block will also be set. To prevent this situation, COMMREQs issued to a given board should be spread across multiple sweeps so that only a limited number (typically 8 or less) of COMMREQs are sent to a given board in each sweep. In addition, the FT output parameter should be checked for errors. If the FT output is set (meaning an error has been detected), the COMMREQ could be re-issued by the application logic.
C block standard math functions do not set errno	In C Blocks, standard math functions (e.g. sqrt, pow, asin, acos) do not set errno to the correct value and do not return the correct value if an invalid input is provided.
Loss of VDD100 or VAL132 after multiple power cycles	In rare instances, a VDD100 or VAL132 module may not configure after power has cycled repeatedly in a very brief period of time. A Loss of IO Module fault will be generated. In extremely rare instances, this may also cause other modules to fail to configure, without generating additional loss of module faults. These additional failures may cause communication with the Ethernet Interface to fail. The user can recover from either of these cases by turning off power for at least 5 seconds and then restoring power. This will provide sufficient "off-time" to ensure that all modules can powerup properly.
Modules Not Reset During Firmware Upgrades	The RX7i currently does not reset any other modules in the system after a firmware upgrade. This may result in Loss of module faults being generated for smart modules.

Subject	*Description*
Unable To Communicate Through Some Third Party Serial Cards	PACS Systems serial ports do not work with some third party serial cards.
Incorrect COMMREQ Status For Invalid Program Name	The program name for PACSystems is always "LDPROG1". When another program name is used in a COMMREQ accessing %L memory, the error that is generated is a 05D5, which is an invalid block name.

Ethernet Operational Notes

Subject	*Description*
MAC address	A label on the rear wall inside the CPU's battery compartment identifies the MAC address assigned to the CPU's embedded Ethernet Interface. 
Configuration of IP address is required before using Ethernet communications	The Ethernet Interface within the CPU module cannot operate on a network until a valid IP address is configured. The necessary Ethernet addressing information must be configured prior to actual network operation, or to recover from inadvertent changes to the Ethernet addressing data at the Ethernet Interface. Use one of the following methods to initially assign an IP address: ■ Connect a serial terminal to the Station Manager port of the PACSystems RX7i. Then use the CHSOSW command to enter the desired IP address. For details, see the *PACSystems TCP/IP Communications Station Manager* manual, GFK-2225. ■ Temporarily assign an IP address to the module using the SetIP tool over the Ethernet network. For details, see *TCP/IP Ethernet Communications for PACSystems,* GFK-2224. ■ The Ethernet Interface automatically obtains a temporary IP Address from a BOOTP server on the network. For details, see *TCP/IP Ethernet Communications for PACSystems,* GFK-2224. Once a temporary IP address has been set up, the Ethernet Interface can be accessed over the network (such as by the Machine Edition programming software). The programmer should then be used to configure the proper IP address for the Ethernet Interface.

Subject	Description
Proper IP addressing is always essential	The PACSystems RX7i CPU's embedded Ethernet Interface must be configured with the correct IP Address for proper operation in a TCP/IP Ethernet network. Use of incorrect IP addresses can disrupt network operation for the PACSystems RX7i and other nodes on the network. Refer to TCP/IP Ethernet Communications for the PACSystems RX7i, GFK-2224 for important information on IP addressing. When storing a new HW configuration to the RX7i, be sure that the hardware configuration contains the proper Ethernet addressing data (IP Address, Subnet Mask, and Gateway IP Address) for the RX7i. **Note:** Machine Edition programming software maintains the target IP address (used to connect the programmer to the target) independent of the contents of the HW Configuration for that target. The target IP address is set in the Target Properties in the CME Inspector window. Storing a HW Configuration whose Ethernet addressing data contains an IP Address that is different from the RX7i target IP address will change the IP address used by the target RX7i as soon as the Store operation is completed; this will break the Programmer connection. Before attempting to reconnect the Programmer, you must change the target IP address in the Target Properties in the CME Inspector window to use the new IP address. To regain communication at the former IP address, use the manual corrective action described above. Storing a HW Configuration containing default (0.0.0.0) or incorrect Ethernet addressing data to the PACSystems RX7i will result in loss of the Programmer connection and will require manual corrective action as described above.
Default IP address (0.0.0.0) attempts to set IP address via BOOTP	The default IP address value (0.0.0.0), whether obtained from HW Configuration or backup configuration, causes the Ethernet Interface to request a temporary IP address from a BOOTP server device on the network.
LAN must be tree, not ring	The two Ethernet network ports on the PACSystems RX7i Ethernet Interface must not be connected, directly or indirectly, to the same network device. The hub or switch connections in an Ethernet network must form a tree and not a ring; otherwise duplication of packets and network overload may result. In this situation, the RX7i Ethernet modules will continually reset.
Reporting of duplicate IP address	The PACSystems RX7i does not log an exception or a fault in the PLC Fault Table when it detects a duplicate IP address on the network.
Multiple zero period EGD exchanges may not produce similar numbers of samples	If more than one EGD produced exchange is configured for a production period of zero, the exchanges may not produce similar numbers of samples. Due to the way that scheduling occurs when multiple exchanges are scheduled "as fast as possible," some zero period exchanges may produce significantly more samples than others. For more consistent EGD production, configure the produced EGD exchanges with non-zero production periods.
Changing IP address while SRTP connection open may generate log events	Open SRTP Server connections established with a remote SRTP client are not terminated as expected when the RX7i's IP address is changed (typically by storing a new HW Configuration to the RX7i). A Series 90 SRTP client ("SRTP channels") reports either a 9690H or 0190H status; the SRTP connection may remain open until the connection is terminated as a result of a client timeout.
Series 90-70 datagrams are not supported	Series 90-70 datagrams are not supported. This means that Series 90-70 - format variable list requests from Host Comm Toolkit applications will fail. (Series 90-30 – format datagrams are supported, but cannot access %P or %L memory in the RX7i.)
AUP parameter should not be changed	The Advanced User Parameter "wsnd_buf" should not be changed by the user. Changing the value of this parameter may cause the LAN LED to go out and the Ethernet Interface to drop connection.
Heavy load can block station manager	A heavy EGD and/or SRTP load can block Station Manager operation. For details, see the *TCP/IP Communications for PACSystems Station Manager Manual,* GFK-2225.

Subject	*Description*
One-time delay of EGD Production (and possibly Consumption) if more than 24 SRTP server connections are started simultaneously	If more than 24 SRTP Server connections are established simultaneously, EGD Production may be briefly delayed for each connection after the 24th when the connections are first made after power is applied. If EGD consume acceleration has been disabled, then EGD Consumption will also be delayed. The delay only occurs once when the SRTP Server connection is established for the first time after Powerup. No delay is experienced for the first 24 SRTP Server connections.
Web server browser restrictions	Internet Explorer version 4.0 running on Windows 98 will give an error when the reference table web page is accessed. Web Server operation has been verified with Internet Explorer version 5.0
Very heavy EGD production/consumption at server may cause EGD command timeouts	Very heavy EGD production and/or consumption at a server device may cause EGD command timeout errors when another device attempts to send EGD commands to that server. If EGD commands must preempt normal production, you may set the "gcmd_pri" Advanced User Parameter to 2 (see GFK-2224, Appendix A). Note that by doing so, EGD exchange production may be delayed.
AUP Parameter Name Change	Beginning with Release 2.00, the following Advanced User Parameters have been renamed to match the Ethernet hardware port identification: "`lduplex1`" is changed to "`lduplex1a`" (Ethernet Port 1A duplex state) "`lduplex2`" is changed to "`lduplex1b`" (Ethernet Port 1B duplex state) "`lspeed1`" is changed to "`lspeed1a`" (Ethernet Port 1A network speed) "`lspeed2`" is changed to "`lspeed1b`" (Ethernet Port 1B network speed) The old parameter names are no longer supported; use of an obsolete parameter name will result in a configuration processing error and an Ethernet exception (Entry = 2, Entry 2 = 06). Existing AUP files using the obsolete parameter names will have to be changed to use the new parameter names.
SRTP application timeouts must accommodate network connection overhead	The application timeouts within SRTP Channels also include the time needed to establish and maintain the underlying network and SRTP connection. Examples are establishing the TCP connection for a new channel, establishing communication with the remote device, and TCP retransmissions during Channel operations. If the time needed for TCP connection establishment or maintenance exceeds the user-specified channel application timeout values, an application timeout will occur. Channel application timeouts are temporary errors; the channel continues to run.

Subject	Description
Client channels TCP resource management	The OS Network stack hangs on to the TCP resources associated with a connection for a period of time after the connection is closed. This time period applies to the initiator of the close, which is almost always the client side. This time is referred to as the “TCP Linger Period”. Once the TCP Linger Period expires (60 seconds in the current OS implementation), the TCP resources are released. Application developers using client channels need to be aware of this behavior when designing their logic. A finite number of TCP resources are allocated to client channels, and if channel connections are brought up and down so fast that these resources are depleted, then the application may have to wait until a TCP resource frees up in order to establish another client channel (a COMMREQ Status of 0xA890 is returned if no TCP resources are currently available; application should wait and try again). SRTP Client Channels provides features that help the user preserve TCP connections. These include a period time where one can establish an SRTP Channel and specify the channel to run at a given interval, or run as fast a possible. One can also specify a number of iterations, or allow the channel to run forever. Additionally, SRTP Channels allows channel re-tasking of an active channel to the same remote device, where the parameters of an active channel, such as changing the channel command type (Read/Write), number of repetitions, time periods, local memory address, remote memory address, etc. can be changed. SRTP Channels also allows channel re-tasking of an active channel to a different remote device (changing the remote device’s IP address, etc.). However, re-tasking to a different remote device will neither conserve TCP connections, nor save on the time it takes to create a channel.
Client Channels and Redundant IP	In a Redundancy System, Client Channel COMMREQs can only be initiated from the unit that owns the Redundant IP address. Therefore, the user application logic should use Bit 6 in the LAN Interface Status bit area, “Redundant IP Active” as part of their enabling logic that drives a client channel COMMREQ.
Idle Modbus/TCP connection between a Series 90 and a PACSystems may be prematurely terminated	An idle Modbus/TCP connection between a Series 90 and a PACSystems may be prematurely terminated. There is an incompatibility between the TCP "Keep-Alive" timer values on the PACSystems Ethernet Interfaces and Series 90 Ethernet Interfaces. The issue is that the default value of the keep-alive timer for the Series 90 modules is set to a much higher value than for the PACSystems. To keep TCP connections open between a Series 90 Ethernet Interface and a PACSystems Ethernet Interface, the Series 90 Interface Advanced User Parameter wkal_time should be set to the value 750 to match that of the PACSystems. With this change, TCP connections remain open indefinitely. Note that this same issue occurs for SRTP Client Channels that have infrequent traffic and can be resolved by using the same technique.
An attempt to open 17 or more Modbus server connections may appear successful	If more than the maximum 16 supported Modbus Server Connections are attempted, the TCP connection may succeed, but no data may be subsequently transferred.
SRTP connections remain open after IP address changed	The Ethernet Interface does not terminate all open SRTP connections before changing its IP address. Once the local IP address has changed, any existing open TCP connections are unable to normally terminate. This can leave SRTP connections open until their underlying TCP connections time out. If quicker recovery of the SRTP connection is needed, modify the “wkal_idle” Advanced User Parameter to reduce the TCP keep alive timer down to the desired maximum time for holding open the broken connection. Refer to *TCP/IP Ethernet Communications for PACSystems,* GFK-2224, for details.

Ordering Information

Description	Catalog Number
RX7i VME 600MHz CPU with Redundancy	IC698CRE030
RX7i VME 1800MHz CPU with Redundancy	IC698CRE040
Auxiliary Battery Module	IC693ACC302
Redundancy Memory Xchange Module	IC698RMX016
Rack Fan Assembly, 120VAC Rack Fan Assembly, 240VAC Rack Fan Assembly, 24VDC	IC697ACC721 IC697ACC724 IC697ACC744
RX7i PLC Power Supply, 85 to 264 VAC at 47 to 63 Hz Input, 100 watt output	IC698PSA100
RX7i PLC Power Supply, 85 to 264 VAC at 47 to 63 Hz Input, 350 watt output	IC698PSA350
RX7i Power Supply: 24 VDC Input, 300 watt output	IC698PSD300
[Optional] RS-232 cable; also Station Manager cable for Ethernet interface	IC200CBL001

Note: An IC698CPE030 can be converted to a CRE030, and a CPE040 to a CRE040, by installing different firmware and moving a jumper. Detailed instructions are included in the firmware upgrade kits for the CRE030 and CRE040.

Note: For Conformal Coat option, please consult the factory for price and availability.

Product Documentation

PACSystems RX7i CPU Reference Manual, GFK-2222

PACSystems RX7i Installation Manual, GFK-2223

TCP/IP Ethernet Communications for PACSystems, GFK-2224

PACSystems TCP/IP Station Manager Manual, GFK-2225

PACSystems RX7i User's Guide to Integration of VME Modules, GFK-2235

PACSystems RX7i C Toolkit User's Guide, GFK-2259

PACSystems Hot Standby CPU Redundancy User's Guide, GFK-2308

PACSystems RX7i Memory Xchange Modules, GFK-2300

Proficy™ Machine Edition Getting Started, GFK-1868

Logic Developer – PLC Programming Software Getting Started, GFK-1918

Auxiliary Battery Module, GFK-2124

Installation in Hazardous Locations

The following information is for products bearing the UL marking for Hazardous Locations:

- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2;
- WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND
- WARNING - EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
- EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C, & D, DIV. 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS LOCATIONS ONLY.